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Goddard Space Flight Center

Inside Wallops

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Wallops Scientists Detect Rapid Thinning of Greenland's Coastal Ice

Scientists who want to monitor the state of our global climate may have to look no farther than the coastal ice that surrounds the Earth's largest island.

A study of Greenland's ice sheet reveals that it is rapidly thinning. In an article published in the July 21 issue of Science magazine, project scientist, Bill Krabill, (Observational Science Branch), reports that the frozen area around Greenland is thinning, in some places, at a rate of more than three feet per year. Any change is important since a smaller ice sheet could result in higher sea levels.

PAO digital photo.
Bill Krabill explains the Greenland Ice Mapping Mission.

"A conservative estimate, based on our data, indicates a net loss of approximately 51 cubic kilometers of ice per year from the entire ice sheet, sufficient to raise global sea level by 0.005 inches per year, or approximately seven percent of the observed rise," Krabill said.

"This amount of sea level rise does not threaten coastal regions, but these results provide evidence that the margins of the ice sheet are in a process of change," Krabill said. "The thinning cannot be accounted for by increased melting alone. It appears that ice must be flowing more quickly into the sea through glaciers."

Greenland covers 840,000 square miles and 85 percent of the island is covered by ice, some of which is up to two miles thick. With its southern tip protruding into temperate latitudes, monitoring this portion of the ice sheet may be one of the best ways to measure changes in our climate, at least in the Northern Hemisphere.

The ice mapping was completed by Wallops personnel that have been surveying the Greenland ice sheet for nearly seven years. In 1993 and 1994, Wallops researchers surveyed the ice sheet using an airborne laser altimeter and precision global positioning satellite receivers. Those same areas were surveyed again in 1998 and 1999.

Now, for the first time, portions of the entire ice sheet covering Greenland have been mapped with sufficient accuracy to detect significant changes in elevation. Krabill noted that while some internal areas of Greenland show slight ice thickening, most areas along the coast show significant thinning. "Why the ice margins are thinning so rapidly warrants additional study," according to Krabill. "It may indicate that the coastal margins of ice sheets are capable of responding more rapidly than we thought to external changes, such as a warming climate."

"For the first time, we are seeing evidence that one of the two great ice bodies on the Earth (the other is the Antarctic ice sheet) is contributing, in a modest fashion, to observed sea level rise," said Dr. Ghassem Asrar, Associate Adminis-trator for NASA's Office of Earth Science. "NASA's ICESat spacecraft, which is scheduled for launch in 2001, will allow us to make similar measurements routinely and keep an eye on Antarctica and Greenland."

Further information on the Greenland mapping project, including the technology behind the science, is available at: *http://aol.wff.nasa.gov/aoltm.html* Imagery supporting this story is available at: *http://svs.gsfc.nasa.gov/imagewall/greenland.html*

Wallops Shorts…….

Fire Department Responses

July 14 to July 20
Aircraft Stand-bys — 40
Fire Alarms — 2
Ambulance Calls — 0
Mutual Aid Assistance — 0

TSP Open Season Closing

July 31 is the closing date for the current open season in which federal employees may join the Thrift Savings Plan or change the level or allocation of their ongoing investments. The next open season will begin November 15 and end January 31, 2001.

Computer Hacker Never Endangered Shuttle Astronauts

News reports that a computer hacker endangered the lives of Space Shuttle astronauts during a 1997 mission are wrong. A report from the British Broadcasting Corporation (BBC) said a hacker compromised NASA computers, endangering the lives of American astronauts.

NASA's Inspector General's office found that during the STS-86 mission in September of 1997, the transmission of routine medical information was slightly delayed due to a computer hacker. However, the transmission was successfully completed.

At no time was communication between NASA and the astronauts compromised. The communication interruption occurred between internal ground-based computer systems.

There has never been an interruption of communication service with the Shuttle due to computer hacker attacks. The command and control communications links between Mission Control and a Space Shuttle in orbit are extremely well insulated.

The 1997 incident is currently under investigation by NASA's Inspector General's office.

Time Travel Through A Trail Of Comet Dust

Scientists believe they may one day be able to travel through time by looking more closely at the dust swirling with a comet as it hurdles through our galaxy. Research also indicates that theories of how comets were formed may need to be revised.

Comets are lumps of ice, gas, rock, and dust - frozen relics from the birth of our solar system - that orbit the Sun. Scientists now believe comets could have formed at different times during the evolution of the solar nebula and may reveal their age by the structure of the dust they carry.

Within a comet's cosmic cloud, astronomers have found two kinds of dust grains; grains with their molecules stuck together every which way, called amorphous, and grains with molecules that have an orderly, crystalline structure. The dust emit light of various colors at different intensities, allowing astronomers to distinguish between the two.

Riding Out The Storm

What is the difference between a tropical disturbance, a tropical depression, a tropical storm and a hurricane?

A *tropical disturbance* is a discrete system of organized showers and thunderstorms that originates in the tropics and maintains its identity for 24 hours or more.

A *tropical depression* is an organized system of clouds and thunderstorms with a defined counterclockwise circulation and maximum sustained winds of 38 mph or less.

A *tropical storm* is an organized system of strong thunderstorms with a defined circulation and maximum sustained winds of 39 to 73 mph.

A hurricane is an intense tropical weather system with a well defined circulation and sustained winds of 74 mph or greater.

What are the different parts of a hurricane?

The typical hurricane has two or three and sometimes more outer convective bands. These bands are made up of cells resembling ordinary thunderstorms and can be up to 300 miles from the eye. The outer convective bands are generally 40 to 80 miles apart and come in advance of the main rain shield.

The rain shield is a solid area of rain that typically becomes heavier closer to the eye. The outer edge is well defined. Its distance from the eye varies greatly from storm to storm. Spiral bands or convective rings are regions of active showers and thunderstorms that encircle the centers of hurricanes. They are prevalent in more intense hurricanes and curve cyclonically inward toward the center of the storm where they appear to merge to form the eye wall. The eye wall is an organized band of thunderstorms that immediately surrounds the center or eye of a hurricane. It typically has the fiercest winds and most intense rainfall.

The eye is a relatively calm center of the hurricane. The winds are light and skies may be partly cloudy or even clear. The average hurricane eye diameter is a little more than 20 miles. Generally, when the eye is shrinking in size, the hurricane is intensifying. After the eye passes, the violent wind blows in the opposite direction it was before the eye moved over an area and the heavy rain returns.

Tropical Weather Web Sites

NWS National Hurricane Center
http://www.nhc.noaa.gov

NOAA http://hurricanes.noaa.gov/

FEMA and Lowes sponsored Hurricane Central page http://www.storm99.com

Dr. William Gray's Seasonal Hurricane Forecasts
http://tropical.atmos.colostate.edu/forecasts/index.html

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PAO digital photo.

Charles Lipsett, Carrier Systems Branch, prepares to remove SEM-06 experiments from a SEM module. SEM-06 flew on Space Shuttle STS-101 that was launched May 19, 2000.

Retirement Planning Workshop

August 28-30, 2000
9 a.m. - 4:30 p.m.
Building E-2

Target Audience

Federal employees who are 3-5 years from retirement or retirement eligible and their spouses

Course Description

This course is designed to highlight the benefits available within Federal Service and explore options to maximize them. All aspects of FERS, Trans-FERS, CSRS, CSRS-offset employee programs will be examined. A common sense approach to financial planning will follow showing how to take the fear out of financial planning and how to become a wise financial consumer.

The seminar provides exposure to experts in each of the topics shown below.

Topics Covered

CSRS and FERS
Social Security Implications
Thrift Savings Plan
Insurance needs, benefits and options to include FEGLI and FEHBP
Lifetime fitness and health
Financial planning and estate planning

For more information contact Sherry Kleckner, x1204.

Tickets for NASA Day

NASA Day at King's Dominion is Saturday, July 29, 2000. The Wallops Exchange will be selling tickets through close of business on July 25 for this event. The cost of the tickets is $26.50 for adults (13 and up) and $21.40 for children (3 - 12). This price includes a free meal ticket for lunch.

Contact Pam Milbourne, x2020 for additional information.

National Korean War Veterans Armistice Day

Per Presidential Proclamation released on June 23, 2000, the flags are to be flown at half-staff on July 27, 2000, in memory of the Americans who died as a result of their service in Korea. By Public Law 104-19 (36 U.S.C. 127), the Congress has designated July 27, 2000, as "National Korean War Veterans Armistice Day."

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Editor Betty Flowers
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http://www.wff.nasa.gov